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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Michael Richard Richardson

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EXAMINER

YU, LIHONG

ART UNIT

PAPER NUMBER

2611

MAIL DATE

DELIVERY MODE

06/23/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/521,747

Applicant(s)

RICHARDSON, MICHAEL
RICHARD

Examiner

LIHONG YU

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on April 25, 2008, with respect to the rejection under 35 U.S.C. 102(a) as being anticipated by Anderson et al (US 2003/0017832 A1), have been fully considered but they are not persuasive.

(1) **Applicant's Arguments:** "Nevertheless, none of the cited paragraphs, nor claim 1, relied upon the Examiner, disclose a receiver specifically having a good quality communications link with the base station. The only reference of signal quality is paragraph 246, which indicates that the reference signal has the highest signal-to-noise ratio. However, the signal-to-noise ratio of a reference signal is different from the quality of the communication link with the base station of the signal. Moreover, paragraph 246 refers to the signal-to-noise ratio of mobile transmitter signal, not the signal between a receiver and a base station".

Examiner's Response: The applicant does not clearly specify what constitutes "a good quality communication link with the base station" in step a) of claim 1. In paragraph 0246, Anderson et al describe a reference signal with highest signal-to-noise ratio is received by a reference antenna at a receiver. Anderson et al describe the reference signal is a re-modulated signal. Because modulation method is related to communication link, the reference antenna is

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thus on a “good quality communication link”. In paragraph 0247-0252, Anderson et al describe that there is a direct path between the transmitter and the receiver antenna.

Applicants are reminded that the Examiner is entitled to give the broadest reasonable interpretation to the language of claims. So the Examiner considers “signal with highest signal-to-noise ratio” to be “good quality communication link” within the broad meaning of the term. The Examiner is not limited to Applicant’s definition which is not specifically set forth in the claims. In re Tanaka et al., 193 USPQ 139, (CCPA) 1977.

(2) Applicant’s Arguments: “In addition, there is no disclosure in Anderson et al. of first and second receivers. As noted by the Examiner, paragraph 337 discloses pairs of signals being transmitted to first and second antennas. However, the first and second antennas are both connected to a single receiver. As paragraph 337 describes, a cross correlation of pairs of received signals is performed, but it is performed on the pairs of signals received by two antennas at the same receiver. Anderson et al. is correlating signals at a single receiver because the method is directed to locating a mobile transmitter”.

Examiner’s Response: In paragraph 0337, Anderson et al describes a primary antenna, that is, first antenna, for receiving the reference signal and cooperating antennas, that is, second antenna, for receiving cooperating signals. In paragraph 0051 and Fig. 2, Anderson et al describes the antennas are on separate receivers. In paragraph 0342, Anderson et al shows an example where the first and the second antennas are at different cell sites 5 miles apart. As described by Anderson et al in paragraphs 0234 and 0253, there are two procedures in locating

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processing: 1) the TDOA and FDOA determination and the multi-path processing, which are performed by signal collection system (SCS), and 2) the position and speed determination. In paragraph 0253, Anderson et al. describes that one objective of the two-step method is increasing the effective signal processing gain during the TDOA processing, and it has the advantage of eliminating or reducing phase error, that is signal enhancement. Anderson et al. describes that this method is preferred when the wireless transmitter has a phase noise that is above a predetermined threshold. Anderson et al teaches in paragraph 0245 that location processing normally requires signal of high resolution in order to achieve a sufficient dynamic range.

(3) Applicant's Arguments: "It is submitted that, as claim 21 in Anderson et al. is directed to "a method of locating a mobile transmitter", the requirement for 'determining a most likely range of TDOA and/or FDOA estimates' is used to decide on a possible range for the location of the mobile transmitter and not for selecting areas from within the estimated correlation (step d) of present claim 1) and then using those selected areas for creating a replica of unwanted signals using said selection and said plurality of first signals (step e) of present claim 1)".

Examiner's Response: Please see Anderson et al at paragraph 0340, where Anderson et al describes that the cross-correlation results are searched to find the optimal values in order to quickly perform location processing. See paragraph 0341-0343, where Anderson et al describe that the cross-correlation results of TDOA and FDOA provide a search constraint. In paragraph 0247-0252, Anderson et al describe that using the search constraint and the direct path

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component, that is first signal, the components of multi-path, therefore a replica of unwanted signals, is determined.

(4) Applicant's Arguments: "Regarding claim 4, it is submitted that there is no teaching or suggestion in Anderson et al. of step f) as discussed above and, as a result, there is no teaching or suggestion of any enhanced correlation, nor how such an enhanced correlation could be achieved, it is, therefore, submitted that claim 4 is non-obvious over the disclosure of Anderson et al".

Examiner's Response: Please see Anderson et al at paragraph 0247, where Anderson et al describes subtracting the multi-path components from the received signal, therefore signal enhancement. Anderson et al teaches recursively estimating the components of multi-path, which suggests that finding the cross-correlation results of TDOA and FDOA is performed recursively.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 1 and 2 are rejected under 35 U.S.C. 102(a) as being anticipated by Anderson et al (US 2003/0017832 A1).

Consider claim 1:

Anderson discloses a method of enhancing signals in a mobile telecommunications system (*see para. 0001 and para. 0016, where Anderson discusses a method for enhanced radio communication*), the system comprising:

- a base station and first and second receivers within a reception zone of the base station (*see para. 0254, where Anderson discusses a wireless transmitter that initiates a transmission; see para. 0255, where Anderson discusses the transmission is received at multiple antennas and at multiple signal collection systems in the wireless system*), the method including:
 - receiving a plurality of first signals at the first receiver, the first receiver having a good quality communications link with the base station (*see para. 0337 and para. 0246, where Anderson discusses receiving high quality signal at the primary antenna to be used as reference signal, the high quality signal is achieved through re-modulation*);
 - receiving a plurality of second signals at the second receiver (*see para. 0337, where Anderson discusses cooperating antennas for receiving cooperating signals*).
 - correlating the received signals from both receivers to provide an estimated correlation therefor (*see para. 0338 and para. 0357, where Anderson*

discusses cross- correlating each cooperating signal with the reference signal).

- *selecting areas from within the estimated correlation (see para. 0340 and para. 0357, where Anderson discusses that the cross-correlation results are searched to find the optimal values);*
- *creating a replica of unwanted signals using said selection and said plurality of first signals (see para. 0247, where Anderson discusses estimating the components of multipath signal, therefore a replica of unwanted signals, using the received signal and the direct path signal, that is, the first signal); and*
- *enhancing said plurality of second signals by eliminating said replica therefrom (see para. 0247, where Anderson discusses subtracting the components of multipath signal from the received signal).*

Consider claim 2:

Anderson discloses the invention as shown in claim 1 above, and further teaches the estimated correlation comprises a correlation of propagation delay and frequency shift for the received signals (*see para 0344, where Anderson discusses each correlation is associated with an estimated correlation of Time Difference Of Arrival, that is, propagation delay, and an estimated correlation of Frequency Difference Of Arrival, that is, frequency shift*).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson et al (US 2003/0017832 A1).

Consider claims 3 and 5:

Anderson discloses the invention as shown in claim 2 above, and further teaches correlating said plurality of second signals with said plurality of first signals and the process is recursive (*see para. 0338, where Anderson describes cross-correlating each cooperating signal with the reference signal; see para.0247, where Anderson discusses recursively estimating the components of multi-path received in addition to the direct path component*). However, Anderson does not specifically disclose that the second signals are the enhanced second signals.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to correlate the enhanced second signals with the first signals to have an enhanced correlation, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Consider claims 4 and 6:

Anderson discloses the invention as shown in claim 3 above, and further teaches that the correlation comprises a correlation of propagation delay and frequency shift for the plurality of second signals and the plurality of first signals and the process is recursive (*see paragraphs 0344 and 0247, where Anderson discusses each correlation is associated with an estimated correlation of Time Difference Of Arrival, that is, propagation delay, and an estimated correlation of Frequency Difference Of Arrival, that is, frequency shift*). However, Anderson does not specifically disclose the second signals are the enhanced second signals.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to correlate the enhanced second signals with the first signals to have an enhanced correlation, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIHONG YU whose telephone number is (571) 270-5147. The examiner can normally be reached on 8:30 am-7:00 pm Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lihong Yu/

Examiner, Art Unit 2611

/Shuwang Liu/

Supervisory Patent Examiner, Art Unit 2611